DRAFT

AIR MOBILITY COMMAND

CONCEPT OF OPERATIONS

FOR

Airborne Broadcast Intelligence (ABI)

REAL-TIME INFORMATION in the COCKPIT (RTIC) CAPABILITY

September 1998

Revision 5

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EXECUTIVE SUMMARY

History: Through the employment of the Multi-Source Tactical System (MSTS) 1991- 1996, Air Mobility Command (AMC) identified and refined the command's requirement for enroute situational awareness. This requirement includes a Real Time Information in the Cockpit (RTIC) and mission rehearsal/flight following capability. These requirements are documented in AMC's Airborne Broadcast Intelligence (ABI) Operational Requirements Document (ORD), CAF 315-92 (Feb 97). ABI, designed by Electronic Systems Center (ESC), is the life-cycle replacement for MSTS.

ABI incorporates standard AF Theater Battle Management Core Systems (TBMCS) and applications to meet AMC's requirements. It uses the Combat Intelligence System Automatic Associator (CIS/AA) for intelligence updates and the Air Force Mission Support System's (AFMSS) Portable Flight Planning System (PFPS) for flight planning. Utilizing standard Air Force systems whenever possible negates the need for a large software and hardware development effort. Additionally, ABI utilizes CIS and AFMSS data as electronic data feeds, limiting the data manipulation required by the aircrew.

ABI consists of a processor/correlator, multi-channel, tactical terminal; radio frequency receiver; a Global Positioning System (GPS) receiver; all necessary cryptographic equipment, keyboard/pointing device; and, 2-3 monitors. It requires access to aircraft power, GPS antenna, and UHF SATCOM antenna. Additional monitors can be added providing information to the troop compartment if needed. ABI, as an airborne mission following/situational awareness system, fuses near-real-time (NRT) intelligence, digital mapping, operations data, and imagery. The technology includes flight following, two- and three-dimensional threat displays, terrain perspective views, and mission rehearsal capabilities.

The system loads and stores multi-spectral and high-resolution imagery and navigation charts into a multi-theater-size database. Near-real-time Electronic Intelligence (ELINT) is received and its symbology overlaid onto stored images and charts, indicating detection parameters and lethality ranges in two- and three-dimensional representation. The system uses a GPS derived position report to display current aircraft location on the moving maps, thus providing a flight following capability. While in flight, Mission fly-throughs can be generated as well as interactive, operator-controlled fly-over using three-dimensional imagery merged with digital data to provide terrain perspective views.

Each active duty wing will receive 3 ABI suites; two for deployments and one for in-garrison operations, training, and sparing. Unit/wing Tactics/operations personnel will operate ABI. Aircrews will be responsible for loading operations data including maps, charts, and the flight plan. Intelligence updates will be provided by unit/wing intelligence. ABI is a cryptographic system and requires COMSEC keying material . The keying material and crypto will be

managed by the designated Wing COMSEC Responsible Officer (CRO). Responsibility for the COMSEC and crypto will be transferred to the aircrew prior to stepping to the aircraft.

ABI will be supported by two levels of maintenance. Wing communications (ComSec Sq) units will provide organizational-level maintenance support personnel. ABI will consist of 6 LRUs (Terminal , processor, Hard drive sled, monitor(s) , pointing device, keyboard, shipping cases.) Upon doing line-replacement analysis, line replacement units (LRUs) will be forwarded to the contracted commercial depot for repair. Units shipped to the commercial depot will be turned NLT 14 days to the organizational unit.

The key to success for the ABI program is training. Training is required for the operators, intelligence analysts, and maintainers. TMBCS/ Intel analysis training is available through formal AETC courses. The contractor will provide initial maintenance and operations training. Each site will be provided a complete teaching package (lesson plans, materials) to be maintained by the organization for on going training. Specific training in intelligence areas will be performed through NRO/OSO training.

1.0 INTRODUCTION - Successful strategic and tactical air mobility combat missions require time critical mission analysis, dynamic threat environment updates, and enhanced situational awareness. To ensure successful missions, enroute aircrews must receive the most current intelligence and operations information available. An airborne mission following system fusing available near-real-time (NRT) intelligence, digital mapping, and imagery information can help meet this need. Airborne Broadcast Intelligence (ABI) was designed by Electronic Systems Center (ESC) as follow-on to Multi-Source Tactical System (MSTS) to meet this requirement.

1.1 SCOPE - This document provides the Concept of Operations (CONOPS) for ABI. The CONOPS describes how AMC will use ABI to support inter-theater and intra-theater airlift and worldwide air refueling missions. The CONOPS also describes wing-level ABI support requirements needed to meet mission objectives.

1.2 BACKGROUND - AMC's Real Time Information in the Cockpit (RTIC) efforts started in 1989 with the Air Force Tactical Exploitation of National Capabilities (AFTENCAP) Special Project VOLANT WIZARD. Initial VOLANT WIZARD demonstrations were followed with the development and employment of the Multi-Source Tactical System (MSTS). The MSTS suites were employed on various airlift and tanker aircraft during operation DENY FLIGHT, JOINT ENDEAVOR, PROVIDE COMFORT, PROVIDE PROMISE, UPHOLD DEMOCRACY, RESTORE DEMOCRACY, and VIGILANT WARRIOR missions. Overall, these cumulative efforts established the operational utility of onboard situational awareness equipment for air mobility missions.

1.3 REFERENCES -

- Multi-Source Tactical System (MSTS) Combat Mission Need Statement 002-92
- AMC ABI Operational Requirements Document (ORD) (CAF 315-92)
- ESC/IYB ABI Acquisition Product Baseline
- Draft Integrated Logistics Support Plan (ILSP) for ABI, Jan 97
- AMC MSTS CONOPS (1994)
- 1998 AMC Air Mobility Master Plan (AMMP)

1.4 TASK ORGANIZATIONS -

- Program Management: OPR: AMC/XPR, OCR: AMC/DOK, AMC//INY
- Product Development: ESC/IYB
- C4I Systems Migration: ESC/TBMCS, ESC/ACU (AFMSS), ESC/ACF (TBMCS)
- Development Contractors: Lockheed Martin Command and Control Systems, Boeing Aerospace, BTG, Mnemonics, CODAR

1.5 SITUATION

1.5.1 GENERAL - Air mobility supports America and the National Military Strategy across the spectrum of conflict, from peacetime operations for America's global interests to major regional contingencies and nuclear deterrence. Airlift and air refueling will deliver the bulk of the initial firepower and the time-critical supplies for peacekeeping and humanitarian relief. Air mobility is an integral part of power projection, force sustainment, humanitarian, and peacekeeping operations.

1.5.2 GENERAL TASKS OF AMC FORCES - AMC conducts a wide range of air mobility missions supporting the National Command Authority and serves a vital role in all phases of operations ranging from peace to war. Airlift missions include: cargo and passenger airlift; airdrop of troops, supplies, and equipment; aeromedical evacuation; and support for special operations. Air refueling tasks include: deployment/redeployment of fighters and bombers; force extension of tankers and airlifters; employment as a force multiplier for combat operations; execution of the single integrated operational plan (SIOP); and support for joint multi-national and special operations aircraft.

2.0 EXECUTION

2.1 OVERVIEW - ABI can support the full spectrum of air mobility missions supporting Global Reach ranging from complex conventional or unconventional operations involving armed conflict, to peacetime operational/exercise sorties, to humanitarian relief operations, and routine ABI operator training.

ABI is designed to improve aircrew situational awareness while flying in a threat environment. As a "snap-on" system, it can be quickly installed (15 minutes) on the C-5, C-17, C-130, C-141, KC-10, and KC-135 aircraft. Three ABI suites will be delivered to each AMC active duty wing. Two systems will be used for deployments while the third system will be reserved for in-garrison support, training, and sparing. There is no difference between the flying unit and the garrison unit. This is ensures that the garrison unit can be used as a whole unit spare based on mission need.

Operations personnel at the wing Tactics office will maintain the ABI. Once mission planning is complete, the mission plan and maps/charts can be downloaded from the AFMSS, via the CFPS 3.5: floppy disk format. Imagery and threat order of battle data will be preloaded in the hard drives or can be downloaded from the CIS. The system is capable of accepting updates from AFMSS and CIS through magnetic media (4mm data tape cassette), 3.5" floppy disk, CD ROM, or manual data entry. The 4mm data tape will be the primary means of transferring data into the ABI. The tactics shop personnel assisted by the Aircraft Communications and Navigation Systems (comm/nav) technician (AFSC 2A4X2) will install the ABI hardware on the aircraft. The tactics shop personnel will install the hard drives and key the radios, once the flight plan and threat data are loaded the ABI will be ready for operations. The system can then be cycled off and when turned on, will be up in 15 minutes with limited interaction (key loading depending how long the system was off).

2.2 UNIT OPERATIONS

2.2.1 ABI **OPERATIONS CONCEPT -** The ABI can receive database updates from the ground-based Theater Battle Management Core System (TBMCS) or the National MIDB 2.X sources (480th Intel Sq) prior to airborne operations, but the system can operate without these sources or older information already installed in the system. Using the current MIDB ensures a common intelligence picture of the battlespace throughout the mission. This will be accomplished by updating the data stored on ABI's hard drives via a 4mm data tape cassette or using the CDROM port. If this option is not available, a manual update is possible. During airborne operations, the uploaded database is updated by an embedded processor-correlator that receives multi-channel, multi-intelligence sensor inputs from several broadcasts. The TRAP Data Dissemination System (TDDS), Tactical Data Information Exchange System Broadcast (TADIXS-B), Tactical Information Broadcast Service (TIBS), and Tactical Digital Information Link-A (TADIL-A) all provide inputs to update the ABI system.

These inputs are correlated to produce a single Situational Awareness (SA) picture of the battlespace (air, land, and surface threats and threat tracks/histories). This information is provided to the flight crews in graphical form so they can visualize their enroute and objective area threats and implement threat avoidance procedures. When compiled with an on-board mission replanning (vice planning) capability, the flight crews will determine when their flight path comes within hostile target acquisition, tracking radar coverage, and weapon engagement zones. The crew can then plan route or way point changes to minimize their exposure to the threat.

The ABI capability also supports the mission crews. Mission crews are defined as on-board personnel with responsibility to provide C2 for other airborne or ground operations, including Task Force personnel being transported by AMC platforms. Use in this manner, the ABI situation information is integrated with a C2 plan, multi-spectral imagery, and digital map representations to provide the mission crew with required SA information for mission planning support.

In flight, ABI provides a capability to capture screen displays and track histories for post-mission debriefs and incident/event analyses. At intermediate sites, the airborne database would be re-initialized through the appropriate method (secure land line, Secret Internet Protocol Router Network {SIPRNET}, or available CIS/AA ground-based workstation) in order to receive the latest theater intelligence inputs not received over the broadcast. Post-mission, the system will be able to support mission debriefs and analyses using its record and playback functions.

2.2.2 PHASES OF OPERATIONS - ABI operations are separated into four operational phases or stages, each requiring distinct actions from operations, intelligence, and maintenance personnel. The operational phases are mission (flight) planning, mission coordination, in-flight execution, and post-mission actions.

2.2.2.1 MISSION (Flight) PLANNING - Use of ABI capability begins with mission planning. The operations and intelligence planner's work together to ensure mission success. The aircrew and intelligence personnel select information from existing databases through the Air Force Mission Support System (AFMSS) Mission Planning System (MPS) or Portable Flight Planning System (PFPS). The Combat Intelligence System (CIS) provides intelligence threat data to the AFMSS to aid the crews in mission planning. During mission planning, the aircrew will coordinate with unit intelligence on proposed flight routes, way points, refueling areas, drop zones, and other relevant mission information to ensure unit intelligence can provide the most current information and prepare their mission brief. Intelligence collection may require coordination with outside agencies. The mission plan data from the MPS or PFPS, using the CFPS data format, can be loaded directly into the ABI by way of a standard 3.5" data disk. The mission planners and the aircrew can incorporate ABI in the Rules of Engagement for optimum mission success.

Mission Preparation: Unit intelligence personnel will review the mission data and areas of operations for possible threat updates. Unit intelligence personnel will update the ABI Electronic Order of Battle (EOB) through a CIS data file transfer to the ABI hard drive by way of a standard 3.5" data disk.

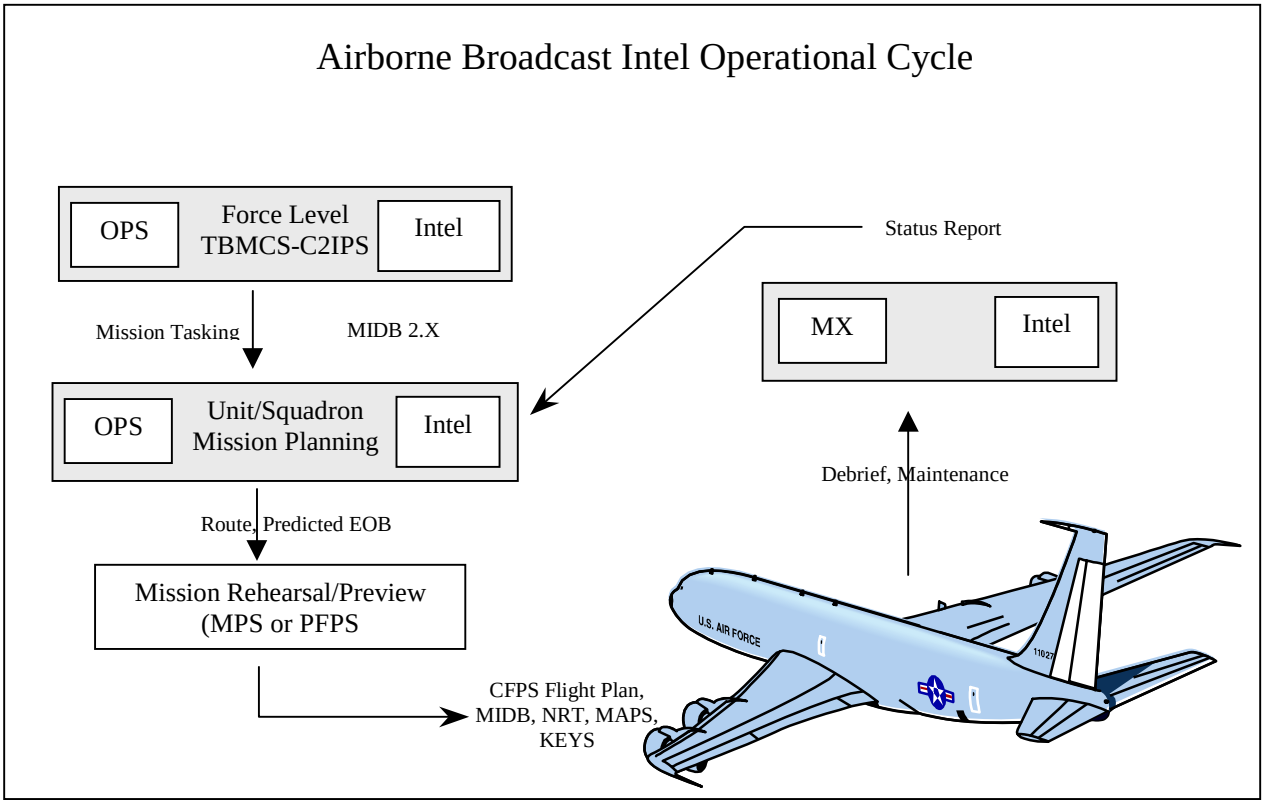
In addition to in-flight use, the ABI can be used to conduct mission preview or training. The flight plan loaded by 3.5" floppy from the PFPS system and is automatically flown at any time ABI is operational. Through its tactical receiver and the CIS correlator module, the ABI can also accept exercise threat data from the TDDS broadcast or through a manual input. This threat data is saved and written to an "exercise database" for training. This database can be used for training without interfering with real world threat data and updates.

Equipment installation and check out: The Tactics shop with the assistance of the Comm/NAV maintenance personnel will install the ABI unit on the aircraft. The ABI contractor will train all personnel on installation procedures and locations. Installation is designed to take less than 15 minutes.

Pre-Flight: Pre-flight of the ABI unit includes loading the flight plan from the MPS or PFPS or manually inputting mission way points by the system operator. Crypto will be loaded using a CZY-10 portable crypto device. The system operator will confirm receipt of all broadcasts and determine display filters and screen configurations. Preflight is designed to take less than 15 minutes.

ABI is designed to be operated by the normal aircrew complement. However, based upon the demands placed on aircrews flying in higher threat level areas, an additional operator should be considered to operate ABI for aircraft flying with a two-person aircrew.

2.2.2.2. MISSION COORDINATION - An operations/intelligence interface must exist for mission success. Aircrews and unit intelligence must work hand-in-hand to use ABI. Operations planners and schedulers must notify aircrews and unit intelligence simultaneously of mission tasking. This is critical since intelligence collection will often require coordination with outside agencies.



Periodically, the operator can look ahead to mission way points, air refueling areas, combat entry and turn points, the objective area, and/or recovery bases, for new threats and/or air activity. The new threats and air activity are overlaid onto multi-spectral imagery and navigational charts that are stored in the system. The aircrew can use this information to determine any necessary mission changes. If mission changes require an alternate refueling area, drop zone, or landing base, the crew can view the multi-spectral imagery of the area for terrain perspectives.

2.2.2.4 POST-MISSION - After landing, the ABI can be used to provide post-mission review or provide an updated ground-based threat awareness capability. During post-mission review, the ABI can download event/track histories from selected files to update ground-based systems. Intelligence personnel can use the information to brief aircrews for follow-on missions. The ABI also has the capability to store up to 100 freeze-frame pictures during flight for post-mission review or mission reconstruction.

If the ABI system is left on the aircraft and secure storage is not provided on the aircraft, the aircrew should zeroize the crypto, and the terminal, remove the hard drive sled from the

processor from the aircraft. The aircrew will ensure proper storage of secure devices in a storage facility cleared for SECRET information. If available, the aircrew should transfer responsibility for the data transfer devices, hard drive, and crypto transfer devices to the wing ABI Designated Approving Authority (DAA). Responsibility for the crypto and keying material can be transferred to the ABI COMSEC Responsible Officer (CRO). If the DAA and/or CRO are not available, responsibility for all crypto and classified material remains with the aircrew.

2.3 DATA REQUIREMENTS

2.3.1 PARAMETRIC DATA - Threat parametric data defines the characteristics of individual threat systems. The Air Force Information Warfare Center provides this data for threat avoidance, route optimization, and tactics planning. This parametric data is dynamic and processing occurs on secondary removable storage media. The Defense Intelligence Agency also develops the Electronic Warfare Integrated Reprogramming updates. When available from wing Tactics, these updates will be provided to the ABI.

Class	Description	Producer	Media	Supplier	Held at Maintenance Org
S	ABI code	Lockheed	CD ROM	ESC/IYB (ABI)	COM Sec Sq
S	ADRG/DTED/DAFIF	NIMA	CD ROM	NIMA	OPS Squadron
S	MIDB 2.X (Air)	480th	CD ROM	ESC/IYB (ABI)	OPS Squadron
S	NRT	Local TBMCS Site	4 MM tape	Local TBMCS Site	OPS Squadron
S	Keys	CPSG	3.5 Disk	Local COM SEC Sq	OPS Squadron
U/S	Training Material	ESC/IYB	CD ROM/Paper	Local Squadrons	OPS Squadron

Figure XX : Data required for operation

2.3.2 MAPPING, CHARTING, GEODESY, AND IMAGERY (MCG&I) DATA: The ABI requires MCG& I data from National Imagery and Mapping Agency (NIMA). MCG&I data includes: digital maps, charts, terrain elevation data, cultural features, imagery, and other types of aeronautical information. Most of the MCG&I data used by ABI will be available through NIMA. Digital maps provide the primary background for flight following and mission rehearsal. Additionally, threat data and friendly track information can be overlaid onto NIMA maps and charts. MCG&I data is relatively static, changing in response to scheduled update procedures. NIMA-produced maps and charts can be ordered through wing intelligence. Wing intelligence personnel are responsible for loading new MCG& I information as products and updates arrive from NIMA and other approved sources. When communications pipelines are capable of handing large MCG&I files, MCG&I data can be transferred electronically over a network interface.

2.3.3 INTELLIGENCE

2.3.3.1 WING INTELLIGENCE - Wing/unit intelligence will maintain a current EOB on the CIS/AA. The wing will receive updates through broadcast feeds to the CIS/AA. Additionally, wing intelligence will maintain Air Order of Battle, Missile Order of Battle, Naval Order of

Battle, and the Digital Automated Air Facilities Information File (DAFIF). Wing intelligence will request and store National Imagery Transmit Format formatted intelligence derived imagery and provide this imagery to operations personnel and aircrews for mission planning and ABI operations.

When a aircrew plans to use an ABI suite, they will request an EOB update from wing intelligence. Utilizing CIS/AA, unit intelligence will update the ABI removable hard drive with a current EOB. Additionally, unit intelligence will assist the aircrew with setting the ABI threat filters to support the planned mission. Unit intelligence will also provide secondary imagery and MC&G data for the mission as needed. Using all available information, including the final mission planning data obtained from the aircrew and/or operations staff, intelligence personnel will continue to monitor their CIS suite for mission-critical information. Intelligence personnel will update the aircrew prior to their departure to the aircraft.

2.3.3.2 ENROUTE INTELLIGENCE SUPPORT - TACC will follow the mission of the ABI-equipped aircraft. If the TACC deems an intelligence update is required, they will request an update from AMC/INO. An update may be required due to a changing threat environment, a lack of broadcast intelligence data, or a mission change. Utilizing TACC SATCOM, INO will update the aircraft with theater imagery and/or threat data.

2.3.3.3 THEATER INTELLIGENCE SUPPORT - Theater Joint Intelligence Centers (JICs) can provide situation updates that are not available from intelligence broadcasts. The theater JIC updates may consist of textual data, annotations for existing imagery, new imagery, and/or graphic updates. The TACC will track ABI-equipped aircraft. Upon request from the TACC, AMC/IN will request intelligence support from the appropriate theater JIC and/or Joint Intelligence Command/Transcom (JICTRANS). Utilizing TACC SATCOM capabilities, AMC/INO will pass this information through available SATCOM channels to the mission aircraft.

2.3.4 OPERATIONAL INFORMATION - Operations information is any data relevant to the unit's Area of Interest (AOI), including intelligence data (e.g., enemy threats), operations data (e.g., Air Tasking Order), and weather data. This data is the foundation for planning optimum ingress and egress while ensuring the mission timing complies with the tasking orders. Operational information changes frequently and can be unpredictable. The unit staff receives new operational information through C4I systems such as Command and Control Information Processing System (C2IPS), TBMCS, AFMSS, CIS, and Global Command and Control System (GCCS). Upon receipt of new operational information, the unit staff will update the ABI database through removable secondary storage media or through electronic data feeds when available. If necessary, the unit staff will input new operational information manually into the ABI.

Certain operational data must be loaded into the ABI for the system to operate correctly. This "set-up" data includes unit or user-unique data and a way point library. The unit/user-unique data includes: security data profiles for default settings, and mission planning data. In contrast,

the way point library consists of navigation check points, radar fix points, and predetermined route segments approved by the MAJCOM/theater command. The aircrew will transfer this data through an electronic feed from AFMSS or enter it manually into the ABI.

2.4 INSTALLATION/REMOVAL - The ABI is configured as a deployable "snap on/snap off" capability. This configuration currently consists of 2 ¾ ATR units and the 2 or 3 display panels with associated cabling. The units will come in three shipping cases and will be a 2 man lift. Under the three-case configuration, the system can be set up and installed or removed from the aircraft in 15 minutes. This will enable the ABI systems to be moved from aircraft to aircraft. When delivered by the maintenance crew, the simplest installation will be to lock the 2 ¾ ATR units into available space in the COMS rack with the display panels velcroed to a predefined location in the cockpit and cables laid for power, antenna and displays.
The crew will mount the pointing device where it is easily accessible.

LRU	Functional Description/Capabilities	weight	Size	Class	Comment
Terminal Receiver	4 Channel UHF RCVR TADIL-A Controller KG-84, KG-40A, KGV-11, KG-96 Crypto External HF feed	< 70 Lbs	¾ ATR Tall L-22, W-11, H-12	Secret, CCI	When not keyed and no software loaded is U/CCI
Processor	Sun Ultra II, Creator Graphics CDROM, 4MM DAT Tape, 3.5" Floppy Commercial GPS, or Military GPS	<40 Lbs	¾ ATR Tall L 22, W-11, H-12	Unclassified when Hard drives removed If P3 GPS the item will be CCI	If Military GPS is in Processor item will be CCI
Hard Drive Sled	Dual 18 Gig Hard Drives	< 5 lbs.		Secret	Unit size and weight is part of processor total
Display(s)	NVG compatible, 13" LCD displays	< 15 lbs.	L-15",W-15", D-3"	UN-Classified	2 units will be shipped for each system
Pointing Device	Strap down pointing device (TBD)	< 8oz	L-3", H-3", H-2"	Unclassifed	1 per system
Keyboard	Ruggedized Keyboard	<2 lbs.	l-16", w-6 ", H-2"	Unclassified	1 per system
Cabling	Single power (50'), dual Display (50") single antenna cable (50")	15 lbs.		Unclassified	
Shipping Cases	3 units	15 lbs each	TBD	Unclassifed	3 units

Figure xx: ABI LRU components and amplifying information

Alternative Mounting location for the ABI terminal and processor. While the communication racks are best suited for the ¾ ATR form factor, the units can be mounted on the deck in a pallet position. However, this will require coordination with the crew and logistics. Mounting on the cargo area competes for floor space for cargo

Connecting to the Aircraft systems: The ABI will use the existing GPS and or SATCOM antennas that are on-board the aircraft. In the event that these are not available ABI will provide a sextant port antenna that will perform both the GPS and SATCOM role. Maximum use will be made of the aircraft's existing bus architecture. Whenever possible, the displays will be "velcroed" or otherwise strapped to predefined areas in the cockpit and/or mission area.

Item	Use	Classification	Comments
AN-CZY 10	Electronic Key Loading Device	An CZY-10 is secret with the CIK Key in , It is U/CCI without the CIK; CIK Key seperated from the AN-CZY-10 is also U/CCI	Standard issue, required for loading terminal Used to hold and key the Terminal.
4 MM DAT Tapes	Used to transport Map information, store snap shoots during flight, dump files, and load the software	Will be classified Secret once loaded.	Standard issue commercial item
3.5" Floppy Disks	Transporting Flight Plans from PFPFS or MPS systems	Will require not be classified with Flight Plan on board	Standard issue, required for loading terminal

Figure XX: Items required to operate system not provided as part of the system

The ABI-designated operator will then install the classified hard drive sled and turn on the ABI equipment and ensure the equipment is operational. The operator will install the cryptological keys, initialize the tactical terminal, and "boot up" the ABI processor. The operator will then confirm the system is functioning properly and receiving the broadcasts.

During the post-mission checkout, the system will be shut down; crypto and tactical terminal cleared of classified data. The classified hard drive and Terminal will be removed and stored in a secure area by the aircrew.

2.5 OPERATING ENVIRONMENTS

2.5.1. INTEGRATED OPERATIONS - AMC will employ the ABI at the wing level. While in garrison, ABIs will be located in an area providing the necessary network connectivity to other C4I systems, physical security, and easy accessibility to the aircrews (e.g., Wing Tactics, Wing Operations Center, Command Post). The wings will operate the systems throughout the world and adapt to local environments including non-integrated operations. As described in the following section, different levels of accessibility to direct (electronic) or indirect (disk) inputs from collocated systems distinguishes this operations environment.

2.5.2 NON-INTEGRATED OPERATIONS - Non-integrated operations occur where wing-level networking capabilities are not available and the aircrew operates independently of their wing's resources. In a non-integrated operational environment, the ABI will receive local

database updates via high or low density, removable secondary storage media, asynchronous data links (e.g., RS-232) or manual inputs.

2.6 INITIAL DEPLOYMENT OF ABI - 3 systems will be deployed to each AMC active duty wing:

437 AW, Charleston AFB, SC
436 AW, Dover AFB, DE
92 ARW, Fairchild AFB, WA
319 ARW, Grand Forks AFB, ND
62 AW, McChord AFB, WA
22 ARW, McConnell AFB, KS
6 ARW, MacDill AFB, FL
305 AW, McGuire AFB, NJ
19 AW, Robins AFB, GA
60 AW, Travis AFB, CA
43 AW, Pope AFB, NC
436 AW, Little Rock AFB, AR
317 AW, Dyess AFB, TX

Additionally, ABI suites will be delivered to the following locations:
TACC, Scott AFB, IL (2 suites)
Air Mobility Warfare Center, Ft Dix, NJ (1 suite)

HQ AMC/DOK will be the single point of contact for changes to ABI equipment deployment locations.

3.0 LOGISTICS - All software and hardware unique to the ABI capability will be Defense Information Infrastructure Common Operating Environment (DII COE) level 5 compliant and will take maximum advantage of any GCCS applications available.

3.1 DATA SUPPORT - As its core, ABI uses CIS functionality from the TBMCS system and data for initial data input..

3.2 SUPPLY SUPPORT - Supply support will be provided as part of the TBMCS Air Logistics Center support program.

3.3 HARDWARE MAINTENANCE - The maintenance concept for ABI is to provide two-levels of maintenance support: organizational (O-level) and depot (D-level, off-equipment). Implementation will be based on cost and mission requirements. At O-level, initial troubleshooting to the LRU is performed by wing/unit comm/nav personnel. Comm/nav personnel will troubleshoot the equipment to identify the failed LRU. The failed unit is then replaced with an available LRU part and the failed part is forwarded to the commercial depot for disposition (repair or replacement). Sufficient LRUs will be in the supply line to ensure 24-hour turn around of the failed unit throughout the operational theater. The commercial depot will have

a two-week resupply timeline. Throwaway items i.e. keyboard, cabling, pointing device, cases, will be restocked through yearly support cost managed by the logistics support center.

Organizational repair personnel will fault isolate using the built-in-test, and remove and replace component boxes (line replacement units - LRU). Depot maintenance will manage the distribution of failed and repaired items and after repair, return them to forward supply points for availability to customers. The source of repair (SOR) decision for each system hardware component and for supporting software will be based on the nature of the item (commercial off-the-shelf-COTS, or developed), the expense to establish a repair infrastructure, and the ability of the SOR to provide cost-effective response to users.

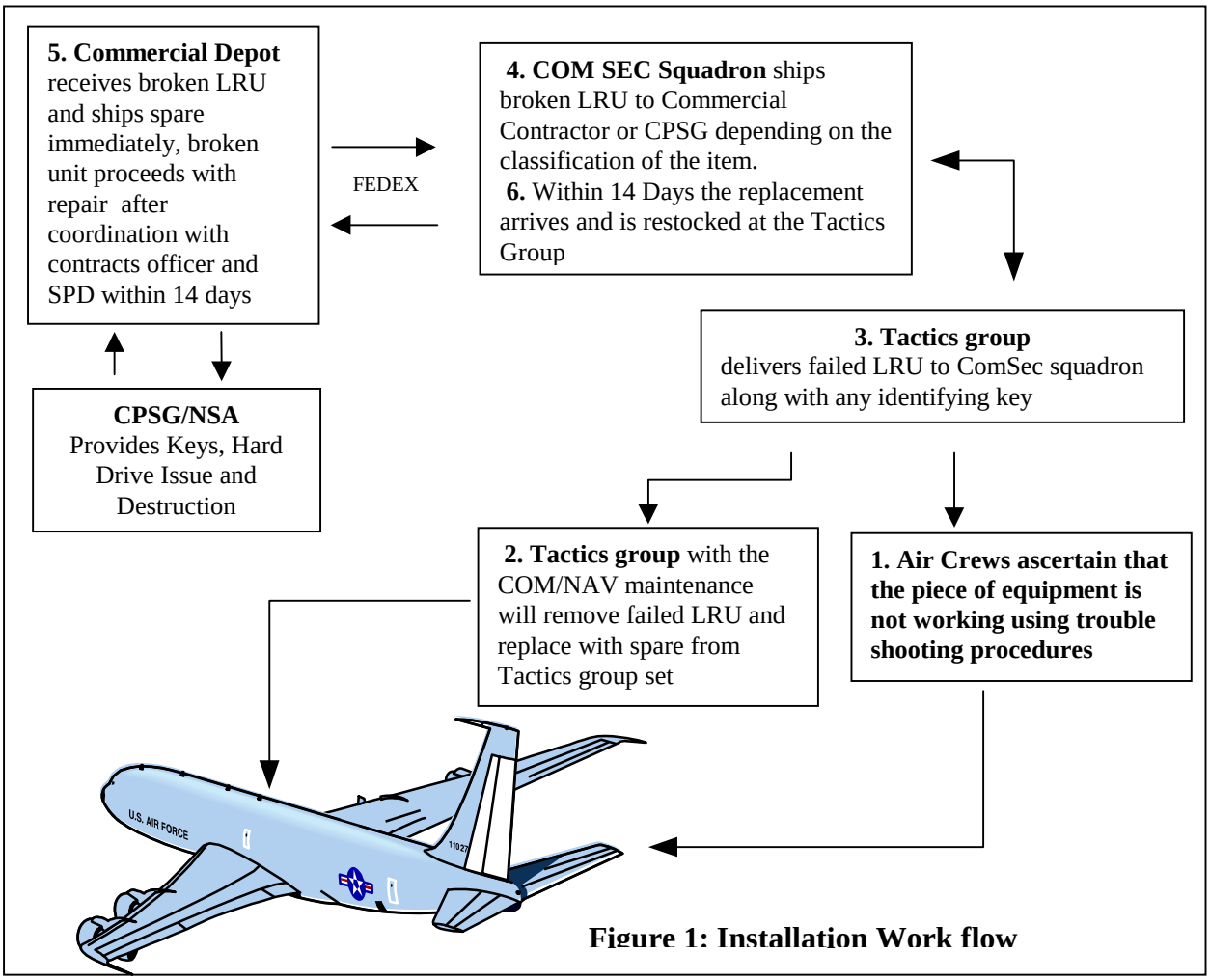


Figure 1: Installation Work flow

3.4 SOFTWARE MAINTENANCE - Software maintenance is a commercial depot level activity following Air Force policy. Software for ABI will be distributed as software. Any firmware is COTS and will be embedded into hardware items. Configuration management for the ABI application software will reside with the Airborne Broadcast Intel (ABI) Program Office at ESC/IYB, Hanscom AFB, MA 01731. Software maintenance for both the radio and the workstation applications includes currency with all broadcasts processed by the ABI system.

ABI software development and support will be outlined in the ABI Computer Resources Life Cycle Management Plan (CRLCMP).

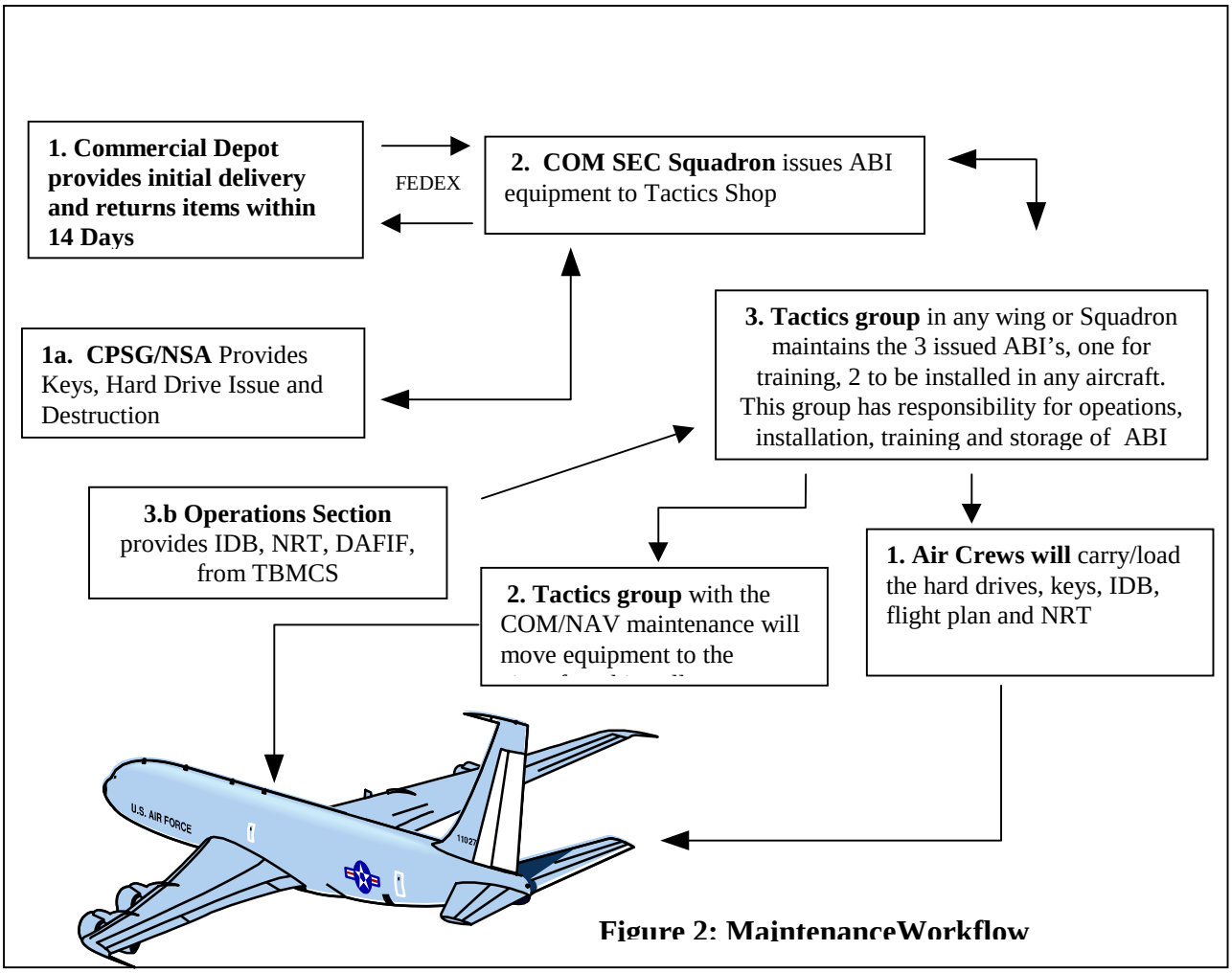


Figure 2: MaintenanceWorkflow

The modified user interface, peculiar to the ABI system, integrated with the TBM product, will be under configuration management of the ABI Configuration Control Board (CCB).

4.0 COMMAND AND CONTROL - While enroute the aircraft commander has ultimate authority for command and control. If the threat environment changes, the aircraft commander will assess the situation, determine the required action, notify the proper command and control agencies, and take appropriate action IAW with the Rules of Engagement (ROE).

5.0 SECURITY - The ABI will process data classified up to and including SECRET/US ONLY. The system's design, operation, and management will be in accordance with AFR 205-16 for computer security, AFR 56 series for communications security, and AFP 55-36 for operations security. ABI users must prevent the unauthorized disclosure of data. The ABI crypto is classified as well as the intelligence and operations data stored in the system (threat information, route of flight, and target information). The system will be handled IAW DOD 5200.1-R, AFR 205-1, and AFR 205-16. COMSEC keying material will be protected at the SECRET level. If

units need to declassify the ABI, users will remove the hard drives from the system and store them in an appropriate facility, remove the crypto, and zeroize the COMSEC keys in the ABI radios. If no storage facility is available, the aircrew retains responsibility for security of the system.

6.0 ORGANIZATIONAL RESPONSIBILITIES - Command program management, including system acquisition and requirements, is the responsibility of AMC/XPR. Upon Initial Operating Capability (IOC) of ABI, program management will transfer to AMC/DOK.

6.1 OPERATIONS GROUP COMMANDERS - Designated Operations Group personnel will control operation and maintenance of ABI suites at the wing level. The Operations Group is also responsible for receiving and updating tactics and parametric data. Wing intelligence will ensure threat data is current and maintain the Compressed Arc Digitized Raster Graphic product library for ABI. However, ABI will be fielded with a complete compliment of CARDG in the system precluding the need for long and complicated loads of CADRG. If possible, intelligence personnel will identify mission intelligence requirements in advance of operational mission planning.

6.2 TACC INVOLVEMENT - TACC is responsible for scheduling and tracking AMC mission aircraft. For high-interest missions, the TACC may chose to closely monitor the flight route of the ABI-equipped aircraft. Utilizing an organic ABI suite, they can determine what threat and operations data is available to the aircrew. If they receive additional information impacting the mission, the data can be relayed to the mission aircraft.

7.0 FUTURE GROWTH

7.1 TBMCS INTEGRATION - ABI utilizes some standard TBMCS software elements as its core. These Air Force systems will migrate to DoD standards such as GCCS and Common Operating Picture (COP). This migration will impact the ABI program. ABI is designed to incorporate these changes, ensuring operational and intelligence databases are available to ABI operators.

7.2 JOINT TACTICAL TERMINAL (JTT) - The ABI tactical receive suite will be the Zebra radio currently used in MSTS. The ABI will migrate to JTT as a life cycle replacement receiver suite as the receiver becomes capable of meeting the necessary performance envelope and becomes available in production quantities.

7.3 ADDITIONAL BROADCASTS - Additional intelligence and operations broadcasts hold added value to the ABI for AMC. The ABI receiver has been designed to incorporate these broadcasts as funding becomes available.

7.4 AIRFRAME INTEGRATION - A RTIC requirement was identified for AMC aircraft through the Air Mobility RTIC working group. As currently envisioned ABI will be minimally integrated into any ari frame. Intersecting only with Aircraft power and if available antennas.

Future integration is planned and is dependent on Aircraft program offices incorporation of the ABI functionality into the new design. To this effect the program office and the AMC command are working with the various SPOs to ensure a smooth transition. The ABI program continues to work with this working group to define a plans to incorporate a RTIC capability as part of aircraft modernization programs.

7.5 TRANSMIT CAPABILITY – The current receiver will not implement transmit capabilities as these are objective requirements for the ABI. However, the current planning is to migrate to the JTT as mentioned above when the radio is in production and when its capabilities match the needs of AMC. The tactical terminal (JTT) will have the capability to transmit from the ABI-equipped aircraft.

7.6 OFF-BOARD C3 DATA - Planned future growth capabilities include integration of off-board C2 data for a COP representation and on-board sensor integration for a complete depiction of the platform's airborne operational environment. An ABI dissemination capability could be used to support execution platforms (e. g., Close Air Support and Air Interdiction platforms) which only require the SA end-product of the ABI processing. The dissemination of this data could be by means of TADIL-J links through platform-organic TADIL-J capabilities.

ANNEXES

ANNEX A

SYSTEM CONFIGURATION

The ABI consists of core functional components: airborne tactical terminal, processor-correlator, and display. Their functions are as follows :

Airborne Tactical Terminal: The terminal is a receiver and processor with appropriate cryptological devices that receive, filter and de-crypt intelligence and tactical broadcasts (currently TADIL-A, in the future TADIL-J). The terminal is a stand-alone LRU and will be serviced as a whole unit. ABI will utilize a commercial terminal. When available the ABI terminal will migrate to the Joint Tactical Terminal (JTT).

The Commercial Terminal is a 4 channel radio that performs TIBS, TRAP, TADIXS-B, TOPS, OBP, SIDS and TADIL-A broadcasts. It is housed in a ¾ ATR tall (12 " in the mounting rack) and is based on 6U VME technology. With an internal TADIL -A modem and cryptological equipment this radio performs all the necessary processing for ABI. Possible add-ons in the AZEBRA may be a Cernal HF radio to relieve the load on the existing aircraft radios.

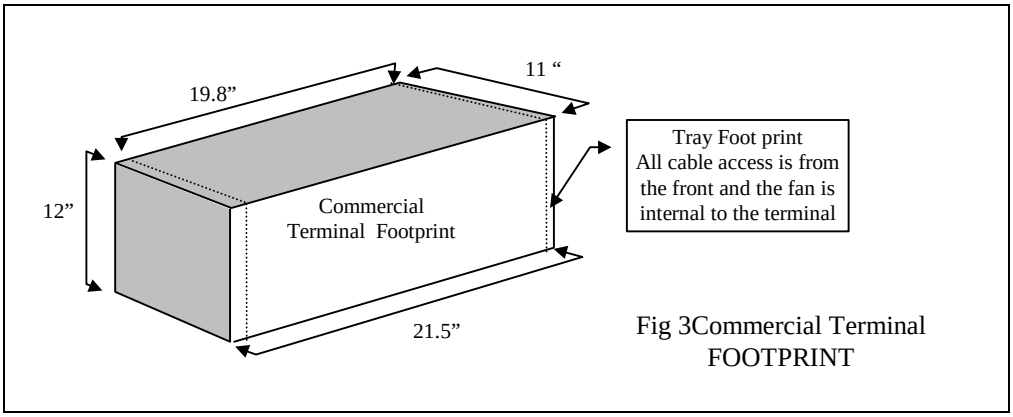


Fig 3Commercial Terminal FOOTPRINT

b. Objective Future Intel Terminal - Joint Tactical Terminal (JTT) and JTT Lite - These radios will be available in the FY01-02 time frame in production quantities and will have 8 receive/2 (JTT) and 4 receive only (JTT Lite) transmit with all internal encryption and possibly a internal processor. This terminal is envisioned to be able to operate with the existing broadcasts and have a DAMA capability.

Processor - The processor-correlator is a stand-alone ¾ ATR unit. It contains 4 MM DAT Tape interface, 3.5" Floppy, CD ROM, disk and hard disk storage as well as a Spark 300Mhz processor with Creaator Graphices display driver.. This processor incorporates the controller for either terminal, airborne correlator, associated Database Management System (DBMS), display drivers, an inflight rerouter/replanner and a moving map application. Future capabilities include an, TADIL-J processing, reach back capability and dynamic threat filtering and alerting. Future processor upgrades will allow the display of data tailored to specific displays.

Display(s) - There are two or more flat panel displays controlled by simple user-operator selectable pull down menus for 2D and 3D, multi-window representation of the situation, rerouter/replanner, threat alerting, and air picture. These displays are NVG compatible and are Velcro'd to any mounting location in the aircraft.

ANNEX H

ACRONYM LISTING

ABI	Airborne Broadcast Intelligence
AETC	Air Education and Training Command
AFMSS	Air Force Mission Support System
AFP	Air Force Pamplet
AFR	Air Force Regulation
AMC	Air Mobility Command
AMMP	Air Mobility Master Plan
AOI	Area of Interest
AWACS	Airborne Warning and Control System
C2	Command and Control
C2IPS	Command and Control Information Processing System
C4I	Command, Control, Communications, and Intelligence
CCB	Configuration Control Board
CIS	Combat Intelligence System
CIS/AA	Combat Intelligence System/Automatic Associator
COMSEC	Communications Security
CONOPS	Concept of Operations
COP	Common Operating Picture
COTS	Commercial-off-the-shelf
CRLCMP	Computer Resources Life Cycle Management Plan
CRO	Communications Security Responsible Officer
DAA	Designated Approving Authority
DAMA	Demand Assigned Multple Access
DBMS	Database Management System
DII COE	Defense Information Infrastructure Common Operating Environment
DOD	Department of Defense
DR	Dead Reckoning
ELINT	Electronic Intelligence
EOB	Electronic Order of Battle
ESC	Electronic Systems Center
GCCS	Global Command and Control System
GNC	Ground Navigation Chart
GPS	Global Positioning System
ILSP	Integrated Logistics Support Plan
IOC	Initial Operating Capability

JIC	Joint Intelligence Center
JICTRANS	Joint Intelligence Center/Transportation Command
JNC	Jet Operational Chart
JTT	Joint Tactical Terminal
LAN	Local Area Network
LRU	Line Replacement Unit
MATT	Multi-Mission Advanced Tactical Terminal
MCG&I	Mapping, Charting, Geodesy, & Imagery
MSTS	Multi-Source Tactical System
NIMA	National Imagery and Mapping Agency
NRT	Near-Real-Time
ORD	Operational Requirements Document
PFPS	Portable Flight Planning System
RTIC	Real Time Information in the Cockpit
SATCOM	Satellite Communications
SEM-E	
SIOP	Single Integrated Operational Plan
SIPRNET	Secret Internet Protocol Router Network
SOR	Source of Repair
TACC	Tanker Airlift Control Center
TADIL	Tactical Digital Information Link
TBMCS	Theater Battle Management Core Systems
TDDS	Trap Data Dissemination System
TIBS	Tactical Information Broadcast Service
TENCAP	Tactical Exploitation of National Capabilities